

Lab Assignment & Solution



Cybersecurity Professional Program
Introduction to Python
for Security

Functions

PY-05-LS1
Calculator

Note: Solutions for the instructor are shown inside the green box.

Lab Objective

Practice creating functions, defining parameters, and performing mathematical calculations in Python.

Lab Mission

Create a function to handle calculation operations.

Lab Duration

15–25 minutes

Requirements

- Basic knowledge of Python

Resources

- Environment & Tools
 - Windows/Linux
 - PyCharm
 - Python 3

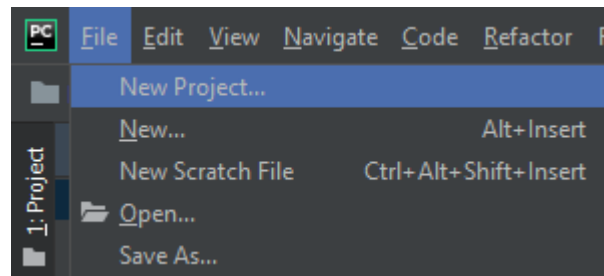
Textbook References

- Chapter 5: Functions
 - Section 1: Introduction to Functions

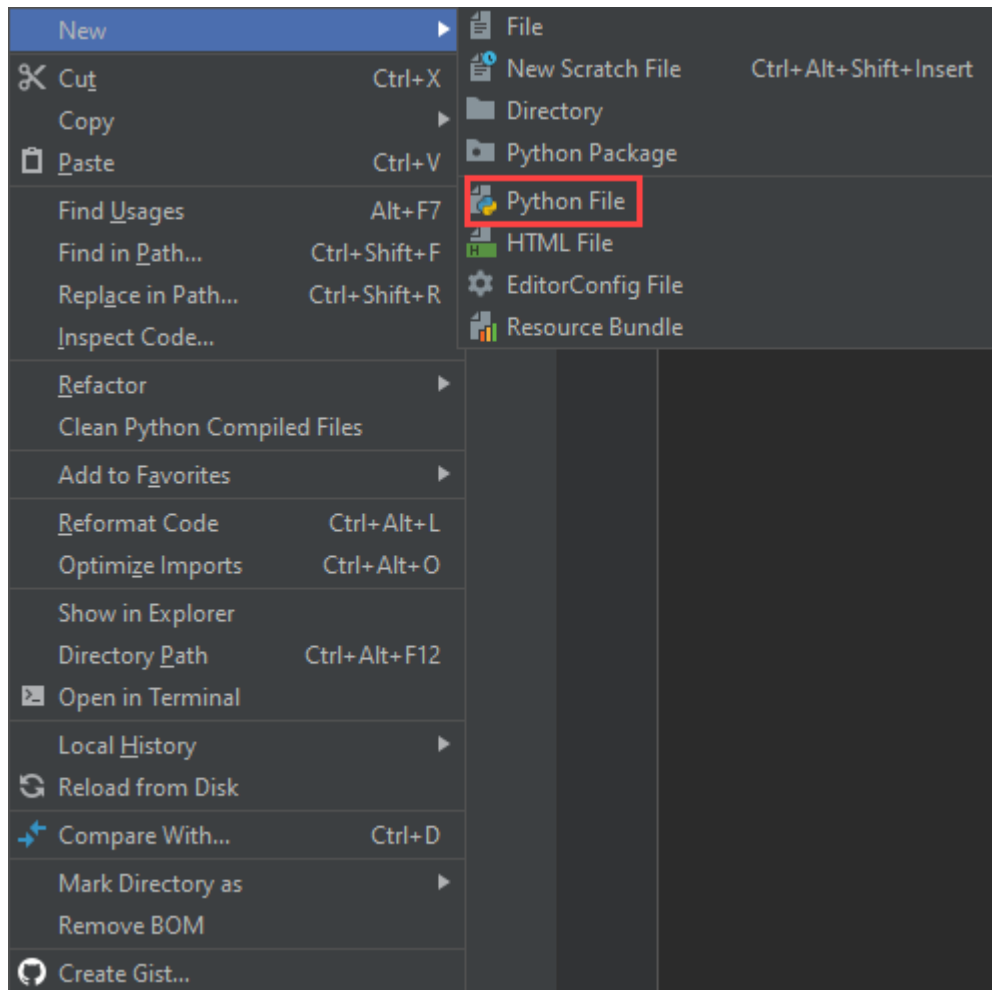
Lab Task: Creating a Calculator with Python

In this task, you will create a program that performs simple mathematical calculations and is separated into functions.

- 1 Open PyCharm, click **File** at the top left, and select **New Project...**



- 2 Create a new Python file in PyCharm by right-clicking the project you created and selecting **New > Python File**.



- 3 Request from the user two numbers and an operator.

```
first_num = int(input("Please enter the first number: "))
second_num = int(input("Please enter the second number: "))
operator = input("Please enter one of the following operators: +, -, *, / :")
```

- 4 Define a function that accepts two parameters for addition.

```
def add(num1, num2):
```

- 5 Configure the function to return the result of the addition and its description.

```
def add(num1, num2):  
    description = "{} + {}".format(num1, num2)  
    return "The result of {} = {}".format(description, num1 +  
num2)
```

- 6 Create a similar function to perform a subtraction operation.

```
def sub(num1, num2):  
    description = "{} - {}".format(num1, num2)  
    return "The result of {} = {}".format(description, num1 - num2)
```

- 7 Create a similar function to perform a multiplication operation.

```
def mult(num1, num2):  
    description = "{} * {}".format(num1, num2)  
    return "The result of {} = {}".format(description, num1 * num2)
```

- 8 Create a similar operation to perform a division operation.

```
def div(num1, num2):  
    description = "{} / {}".format(num1, num2)  
    return "The result of {} = {}".format(description, num1 / num2)
```

- 9 Create the main function that will handle the execution of the calculation commands and print the result.

```
def calc():
```

- 10** Create a dictionary to connect the selected parameter and the appropriate function.

```
def calc():
    allowed_calculations = {"+": add, "-": sub, "*": mult, "/": div}
```

- 11** In the main function, allow the execution of one of the calculation functions to be performed according to the selected parameter and print the result.

```
def calc():
    allowed_calculations = {"+": add, "-": sub, "*": mult, "/": div}

    result = allowed_calculations[operator](first_num, second_num)
    print(result)
```

- 12** Conclude the function's execution from the dictionary with a **try** block. This is used to capture errors of division by 0 and unallowed parameters.

```
def calc():
    allowed_calculations = {"+": add, "-": sub, "*": mult, "/": div}

    try:
        result = allowed_calculations[operator](first_num, second_num)
        print(result)
```

- 13** Add an exception to capture unallowed parameters and print an appropriate message.

```
def calc():
    allowed_calculations = {"+": add, "-": sub, "*": mult, "/": div}
    try:
        result = allowed_calculations[operator](first_num, second_num)
        print(result)

    except KeyError:
        print("The parameter doesn't exist.")
```

14 Add an exception to capture division by zero and print an appropriate message.

```
def calc():
    allowed_calculations = {"+": add, "-": sub, "*": mult, "/": div}
    try:
        result = allowed_calculations[operator](first_num, second_num)
        print(result)

    except KeyError:
        print("The parameter doesn't exist.")
    except ZeroDivisionError:
        print("Can't divide by 0.")
```

15 Invoke the main method to run the program.

```
calc()
```